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**AMERICAN FOUNDATION
FOR THE BLIND INC.**

State of Washington
Department of Social Security
Charles F. Ernst, Director

C A U S E S O F B L I N D N E S S

Pertinent Facts Relative to the Etiology and
Topography. A Study Based Upon Records of 1573
Recipients of Blind Assistance in the State of
Washington from February, 1936 to March, 1939.

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The Law governing Prevention of Blindness and
Restoration of Vision in the State of Washington:

Chapter 132, Session Laws of 1937, Section 3. Prevention of Blindness. "In cooperation with the Department of Public Health, there shall be established and maintained such service as is needed looking toward the prevention of blindness, the purpose of which shall be to determine the causes of blindness, and to inaugurate and cooperate in any preventive measures for the State of Washington as may appear practicable. Whenever a blind or partially blind person can be benefited by medical or surgical treatment for which he is unable to pay, arrangement shall be made for an examination, with the consent of the individual, and for the necessary treatment by an ophthalmologist or physician skilled in the diseases of the eye."

FOREWORD

Association with those working in a common field such as blindness brings about an enlarged consciousness of the problems involved. Individual realization comes first, necessarily, but quickly group spirit is imbued by the desire to help.

State agencies as well as many private organizations such as the Lions Club, the Junior Federation of Women's Clubs, the Delta Gamma Alumni, Lighthouse for the Blind, and other groups have cooperated in preventing blindness and in rehabilitating blind individuals. In one capacity or another, they have been of invaluable assistance. Much of the work accomplished has been due, in great part, to their splendid cooperation.

Especial acknowledgment is made to the National Society for the Prevention of Blindness for the development of the causes of blindness code used. Additional aid has been given by making available the services of their statistician, Miss C. Edith Kerby, who assisted by coding or checking the coding of many of the reports included in the study, and by training staff members in the use of the code.

The information gained by this study may be used as a basis for future community educational programs. From the information compiled it will be easier to prepare various medical and social treatment plans for the incipient cases of blindness. Restoration of sight and prevention of vision loss have been aided as much as financial and other economic factors have permitted. One of the desirable steps in any state program is to furnish information for other states. Progress is made by profiting from the experience of others, by avoiding certain undesirable features, and finally by going forward, sometimes in well-charted pathways, sometimes in new ones. If those doomed to perpetual twilight have had their burden lightened, if only a few people have been prevented from joining the ranks of those doomed to darkness, all the past work will have been of value.

Olympia, Washington

May, 1939

1. The first part of the paper discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the success of any business or organization. The author provides a detailed explanation of the various methods used to collect and analyze data, highlighting the importance of consistency and accuracy in the process.

2. The second part of the paper focuses on the challenges faced by researchers in this field. It discusses the difficulties of obtaining reliable data and the potential biases that can arise from different sources. The author also addresses the issue of sample size and the need for statistical analysis to draw valid conclusions from the data.

3. The third part of the paper presents the results of the study. It shows that there is a significant correlation between the variables being studied, and that the findings are consistent with previous research in the area. The author also discusses the implications of the results for future research and for the practical application of the findings.

4. The final part of the paper concludes the study and provides a summary of the key findings. It emphasizes the need for further research in this area and suggests some potential areas for future study. The author also provides a list of references for the sources used in the paper.

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INTRODUCTION

The Division for the Blind in the State of Washington was created by the 1937 Legislature as one of the four Divisions of the State Department of Social Security.

Separate Legislation was passed (Chapter 132, Laws of 1937) setting forth three distinct programs:

1. Vocational Aid and Training, and
2. Prevention of Blindness and Restoration of Vision, which are administered by the Division for the Blind, State Department of Social Security.
3. Public Assistance for the Needy Blind, which is an administrative responsibility of the various counties under the supervision of the Division for the Blind.

The Vocational and the Prevention programs are financed by State funds, and the Public Assistance program is financed principally by Federal and State funds.

Under present legislation, the Division for the Blind has the opportunity to train blind people in handicrafts so that they may become self-supporting by producing commercial articles in their own homes. Two training centers for this work are maintained, one in Seattle, serving Western Washington, and another in Spokane, serving Eastern Washington. A second method of assisting blind individuals to become self-sustaining is through the placing of such persons in vending stands in public buildings.

In order that blind people throughout the State may be given an opportunity to enjoy normal living, four home teachers, themselves blind, give service to all blind persons, irrespective of financial needs. Not only do they teach Braille and Moon type (both of which are reading systems for the blind), but they give instruction in typing and in simple handicrafts by way of assisting their pupils to find their own niche in community life. It is often necessary, too, for the Home Teacher to develop confidence in blind people in getting about and doing the ordinary day-by-day tasks around the home.

Prior to this time the only provision for the blind from public funds was in the form of assistance payments to the needy. Only scattered efforts had been directed toward providing surgery and other treatment when needed, and no general program for prevention of blindness had been formulated.

ADVISORY COMMITTEES: In order that the Division for the Blind might benefit by the interest and knowledge of various groups, a General Advisory Committee was formed, consisting of business and professional persons. As no public agency program can advance without interest and understanding, the members of this Committee give valuable aid in interpreting the program within their respective communities.

Because of the technical problems involved in a program of Prevention of Blindness and Restoration of Vision, the State Medical Association was asked to

appoint a Chairman for a Professional Medical Eye Advisory Committee to work with the Division for the Blind. This Chairman also serves as a member of the General Advisory Committee. This Medical Eye Committee established a State-wide list of approved eye physicians, using only those doctors who restricted their practice to eye, or to eye, ear, nose and throat work. The Committee immediately reviewed the Physicians' Eye Reports submitted during the previous year, and arranged for reexamination when necessary. Among other responsibilities of this Committee are the establishment of fee schedules, assistance to the Technical Consultant in reviewing Physicians' Eye Reports, development of a plan for consultation with other physicians, and aid in the development of educational programs for the prevention of blindness.

Before an individual is accepted for care in any one of the three programs, the Physician's Eye Report is referred to the ophthalmologist who serves as the Technical Consultant to the Division.

PREVENTION AND RESTORATION:

Because it is axiomatic that prevention is better than cure, emphasis is being placed upon searching out the causes of blindness and developing programs to prevent the recurrence of these causes. A committee, composed of representatives from the Division for the Blind and the State Departments of Health and of Education, was established to make studies and recommendations in regard to conservation of the eyesight of school children. This was to be accomplished by encouraging schools to provide adequate lighting, testing of vision, and the establishment of sight-saving classes wherever indicated. So that teachers and social workers may be better informed about the prevention of blindness, the University of Washington has cooperated by providing certain instruction in the subject.

If programs of prevention of blindness are to be effective, it is necessary that the general public have an understanding of the need for adequate eye care. Educational programs are an important factor and can be accomplished most readily through local community groups. One such state-wide educational project was a study of "Babies' Sore Eyes," Ophthalmia Neonatorum, which was sponsored by the Junior Federation of Women's Clubs.

PRELIMINARY STUDIES:

In facing the problems at the beginning of the present program, it was necessary first to know the number of blind persons within the state and something of their social characteristics. In order to provide this information, a survey was made in 1937 by the Junior Federation of Women's Clubs*. This study showed that there were approximately 2000 known blind people in the State of Washington at that time. This was a somewhat higher percentage than that generally accepted for the country at large, one-tenth of one percent.

This definitely raised the question of the causes of blindness. In a study of 773 available eye reports at that time, it was found that emphasis had been placed upon the degree of blindness but that the etiological and topographical causes of blindness were not indicated on a large number of the reports. However, the study did show that approximately one-third of the blindness was due to cataracts. The need for an adequate physician's eye report was obvious in order that an intelligent approach to the problem of prevention of blindness could be planned

*Survey of the Blind in the State of Washington - Hardin, Gwen, and Potter, Allen R., State Department of Social Security, Olympia, Washington, 1937, pp 26.

CHARACTERISTICS OF THE BLIND

For the present study the Physicians' Eye Reports for all persons accepted for Blind Assistance for a three-year period from February, 1936 through March, 1939 were selected.*

SEX:

Of the 1573 blind individuals included, 969, or 62 percent, were males and 604, or 38 percent, were females. These percentages of males and females are identical with those shown in the study of the blind population of the State made by the Junior Federation of Women's Clubs in 1937.

The incidence of blindness is shown to be decidedly greater among men than among women. Whereas males constitute 53 per cent of the general population, they number 62 percent of the blind population.

Table I. Number and Percentage Distribution by Sex Compared with 1930 Population for Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Sex	Blind Persons 1936-1939		Population 1930	
	Number	Percent	Number	Percent
Total	1573	100.0	1,563,396	100.0
Male	969	61.6	826,392	52.9
Female	604	38.4	737,004	47.1

COUNTY:

Appendix Table A shows the county of residence of those included in the study. No attempt has been made to show the proportion of blindness in any county because the number of blind persons in many of the counties is too small to permit the computation of significant rates.

AGE:

Blindness is definitely an affliction of the older ages. Each ten-year age group of blind persons up to 85 years of age is larger than the preceding group. Approximately one-fourth of the individuals are between 75 and 84 years of age and another fourth are between 65 and 74 years of age. The greatest number at any single year of age is a group of 48 individuals who are 70.

The women are slightly older than the men, the median age for the women being 67.8 years as compared with 65.1 years for the men, a difference of 2.7 years. For the entire group, the median age is 66.5 years. (See Appendix Table B).

*See Appendix B for further discussion of schedules included.

Table II. Number and Percentage Distribution by Eight Age Groups of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Age	Number	Percent
Total	1573	100.0
24 & Under	26	1.7
25 - 34 Years	83	5.3
35 - 44 "	83	5.3
45 - 54 "	186	11.8
55 - 64 "	308	19.6
65 - 74 "	371	23.5
75 - 84 "	380	24.2
85 & Over	136	8.6

AGE AT ONSET:

Blindness ordinarily occurs in the later years of life. With the exception of the 4.5 percent who were born blind or became blind in their first year, comparatively few individuals became blind until their 39th or 40th year of life. Only about 7 percent lost their vision before their 5th birthday, and 24 percent between their 5th and 45th birthday. The largest number becoming blind in any one year of age was 2.7 percent in their 57th year. In comparison with a present median age of 66.5 years for the entire group, the median age at onset of blindness was 54.4 years.

Table III. Number and Percentage Distribution by Twelve Age Groups at Onset of Blindness of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Age at Onset	Number	Percent
Total	1573	100.0
Under 1 Year	70	4.5
1 - 2 Years	21	1.3
3 - 4 "	22	1.4
5 - 14 "	67	4.3
15 - 24 "	71	4.5
25 - 34 "	99	6.3
35 - 44 "	139	8.8
45 - 54 "	252	16.0
55 - 64 "	316	20.1
65 - 74 "	281	17.9
75 - 84 "	140	8.9
85 & Over	22	1.4
No Report	73	4.6

RACE:

The incidence of blindness is higher in Washington among the non-white races than in the white race, the percentage of non-white blind being 3.1 as compared with a percentage of 2.7 of non-whites among the population as a whole. Negroes represent 1.6 percent of the blind group as compared with 0.4 percent in the general population, and the Indians 1.2 percent as compared with 0.7 percent in the general population. As the problem of blindness among Indians has not been fully dealt with, the actual incidence of blindness is probably even higher than the data would indicate. Too small a number of "other races" were assisted to make comparisons valid.

Table IV. Number, by Race and Nativity, of Recipients of Blind Assistance, February 1936, to March, 1939, State of Washington

Race	Total		Native-born	Foreign-born	No Report
	Number	Percent			
All races	1573	100.0	1159	374	40
White	1525	96.9	1113	372	40
Negro	25	1.6	24	1	
Indian	19	1.2	18	1	
Other	4	.3	4		

NATIVITY:

Approximately three out of every four of these blind persons are born in the United States. Native-born whites constitute 70 percent of the blind group, compared with 82 percent in the general population. Little significance, however, can be attached to this comparison because the percentage of foreign-born whites is known to be much higher in the older age groups than in the younger ones. Of the 48 non-white persons, all are native-born with the exception of one Negro and one Indian.

One-half of the foreign-born whites were born in Northwestern Europe, one-sixth in Central Europe, one-tenth in Eastern Europe, and one-fifth in Canada. The largest number came from the following countries: Canada 70, British Isles 62, Norway 51, Sweden 41, Germany 36, and Russia 23. (See Appendix Table D)

RESIDENCE:

Table V. Number and Percentage Distribution by Residence, Compared with 1930 Population, of Recipients of Blind Assistance, February 1936 to March, 1939, State of Washington

Residence	Blind Persons 1936-1939		Population 1930	
	Number	Percent	Number	Percent
Total	1573	100.0	1,563,396	100.0
Urban Total	916	58.2	884,539	56.6
Cities 100,000 & Over	498	31.6	587,914	37.6
Cities 2500 - 99,999	418	26.6	296,625	19.0
Rural	615	39.1	678,857	43.4
No Report	42	2.7		

Six of each ten blind individuals resided in an urban area at the time responsibility was accepted for care. This is a slightly greater proportion than that of the general population in 1930 who resided in urban areas. The percentage of blind persons in cities of from 2500 to 50,000 population is higher than for cities of 100,000 population and over.

LIVING ARRANGEMENTS

When these 1573 individuals were accepted for assistance, the greater number, 1044, or four-sixths, were living in household groups with relatives. Another one-sixth, 254 persons, were living alone. Of the remaining one-sixth, the majority, 140, were in some household group though not with relatives. Of the 66.4 percent residing with relatives, approximately 19 percent (of the total number) were living with spouse, 21 percent with spouse and other relatives, and 27 percent with other relatives without spouse. Many of the latter group were single persons.

Table VI. Number and Percentage Distribution by Living Arrangements (at time of first grant) of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Living Arrangements	Number	Percent
Total	1573	100.0
Alone	254	16.1
In Household Group with Relatives	1044	66.4
In Household Group not with Relatives	140	8.9
In Public Institutions	4	0.2
In Voluntary Private Institutions	26	1.7
In Lodging House	41	2.6
Other	9	0.6
No Report*	55	3.5

* This item was not tabulated for the 40 persons receiving "treatment only"

No report for 15 cases not presented for Federal Matching prior to April, 1937.

CHIEF SOURCE OF SUPPORT:

Table VII. Number by Chief Source of Support (five years prior to acceptance) and Percentage Distribution of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Source of Support	Number	Percent
Total	1573	100.0
Own Earnings	355	22.6
Relatives	404	25.7
Friends	12	0.8
Assistance Total:	740	47.0
Private agency	13	0.8
Public Agency	727	46.2
No report	62	3.9

During the five years immediately preceding application for assistance under the present program, approximately two of each four were dependent upon public agencies and one upon relatives, while one supported himself by his own earnings. As a number of the individuals became blind within the five-year period, the proportion of persons blind throughout the period and maintained by their own earnings was probably much less than the 23 percent shown in Table VII.

DEGREE OF BLINDNESS:

The degree of blindness was determined for each person on the basis of the Snellen Notation. If a person has a vision of 20/200 (can see at 20 feet what a normal individual can see at 200 feet) or less in the better eye after correction, he is usually considered blind within the meaning of Chapter 132, Laws of 1937. Of those included, 79 or 5 percent had a degree of vision better than 20/200. Some of these were individuals who had been given aid by the various counties early in 1936 when the program first came under State supervision but who have since been removed from the Blind Assistance rolls. Other persons are included whose vision is better than 20/200 but whose field of vision is so restricted that they come within the standards set up and maintained by the American Medical Association. Of the group who had vision of 20/200 or less, one-third were totally blind, one-third had light perception only, and one-third had vision greater than light perception. The data shown in Table VIII indicate that the better the vision the greater was the possibility that treatment would improve this remaining vision.

Table VIII. Number and Percentage Distribution by Degree of Blindness and by Recommendation for Treatment of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Degree of Blindness	Recommended for Treatment						Percent	
	Total		Yes		No		Yes	No
	Number	Percent	No.	Percent	No.	Percent		
All Degrees	1573	100.0	255	100.0	1318	100.0	16.2	83.8
Total Blindness	511	32.5	23	9.0	488	37.0	4.5	95.5
Light Perception only	489	31.1	91	35.7	398	30.2	18.6	81.4
20/200 or less	470	29.9	125	49.0	345	26.2	26.6	73.4
Over 20/200	79	5.0	16	6.3	63	4.8	20.3	79.7
No Report	24	1.5	-	-	24	1.8	-	100.0

TREATMENT RECOMMENDED:

At the time of the initial eye examination, the examining physicians considered that the vision of one-sixth of the persons could be improved or that further loss of sight could be prevented by surgery or other treatment. Further consideration may show that the vision of even a greater proportion may be improved. The possibility for improvement in vision by surgery was considered feasible for a larger proportion of persons in the older age groups than in the younger. This is due undoubtedly to the larger number of cataract cases among older persons. In the group 65-74 years of age, 21 percent were recommended for treatment; in the group 75-84 years, 19 percent; in the group 85 years and older, 16 percent, while in the group under 35 years only 10 percent received such recommendation. The 255 who were recommended for treatment had a median age of 69.4 years and the 1318 not recommended for treatment had a median age of 65.9 years. (See Appendix table C).

Table IX. Number, by Treatment Recommended, and Percentage Distribution of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

<u>Treatment Recommended</u>	<u>Number</u>	<u>Percent</u>
Total	1573	100.0
Yes	255	16.2
No	1318	83.8

GENERAL DISEASES AND LOCAL CONDITIONS CAUSING BLINDNESS

GENERAL DISEASES CAUSING BLINDNESS:

In considering the causes of blindness, it has been found that certain general systemic conditions frequently lead to a changed or impaired nutrition of various structures within the eyeball. That diabetes may have some relationship to the production of a cataract is well known. The exact mode of causation of lens change is not clear, but it has been assumed that there is an impaired nutrition of the lens so that a diffuse opacity develops within a short time. Usually younger persons have the true "diabetic" cataract, although after a cataract occurs in the older person, definite improvement of vision results if intensive diabetic treatment is begun. Diabetes also causes an inflammation of the retina. This retinitis may be very severe, sometimes accompanied by hemorrhages, the latter being a frequent and disastrous cause of loss of vision.

Kidneys that do not function properly bring about changes within the retina very similar to those caused by diabetes. Again, it is only the retina usually that is involved. High blood pressure may cause blindness, sometimes by developing retinal changes which resemble those found in diabetic or nephritic conditions but, more often, because of a thrombosis or plugging of one of the retinal veins.

Gonorrhea causes blindness fairly often. Of blindness caused by infection, exclusive of infections at birth (*ophthalmia neonatorum*), one-fourth of the cases among children and about one-half of the cases among adults are due to gonorrheal infection. In spite of the lack of precautions taken by people who have a general gonorrheal infection, regardless of whether children or adults, only a very small percentage of eyes of these people are infected by the germ. Due to improved methods of treatment, not only is the incidence of gonorrhea which involves the eyes being lowered but also the visual complications. The importance of gonorrhea acquired by babies at the time of birth cannot be overemphasized. It is well known that a large percentage of grown-up children and adults who have lost their vision in the present year are the victims of insufficient care at birth. Such persons could have been immeasurably helped before the disease had gained a foothold by the use of a few drops of a weak solution of silver nitrate in the eyes. The use of this prophylactic measure has now become so widespread that the incidence of gonorrhea in the newborn has been definitely lessened. According to a survey made by the National Society for Prevention of Blindness and the American Foundation for the Blind in 1934, *ophthalmia neonatorum* now causes only 7 to 10 percent of the blindness of those entering schools for the blind, whereas formerly 28 per cent of these persons were afflicted as a result of this condition. Such valuable results have been gained from the use of silver nitrate in each eye of the newborn child that the measure should be rigidly insisted upon in every birth. The Washington State Department of Health has made this procedure a part of its Rules and Regulations.

Meningitis may cause blindness because of the involvement of the optic nerve, which is in close communication with the brain, although not all cases of meningitis proceed to blindness. This disease, however, like gonorrhea, now causes less blindness than ever before due to the marvelous new treatments devised within the past few years.

Syphilis is the one disease that may affect the eyes either before or after birth. It is one of the few diseases which may be passed directly from mother to offspring. Although in the past years many cases of blindness have been caused by this disease, now, due to the new ease with which it may be recognized, and to improved and intensified treatment, those women who cooperate by treatments during the time of their pregnancy pass only a few cases of this devastating condition on their children. Acquired syphilis, that type which is found in adults, may cause blindness by involvement of any portion of the eye, but most often the optic nerve is affected. Usually a mild form of meningitis develops which later causes a secondary optic atrophy.

Dr. C. E. Rice, in a very recent publication*, estimated that over \$4,500,000 are spent annually as a cost for blindness due to syphilis. If to this figure, high as it is, be added an estimate of suffering other than blindness, crippling other than loss of sight, wrecking of lives of both children and adults, the fostering of crime, and all of the other losses in this connection, the actual cost of syphilis for the nation amounts to a tremendous sum. Early and efficient treatment of every case of syphilis is the only way to stop the spread of this ravage. Reassuring is the present knowledge that many of the misfortunes which may accompany syphilis can be stamped out.

LOCAL CONDITIONS WHICH CAUSE BLINDNESS:

In addition to these general systemic diseases, certain anatomical changes of the eyeball cause blindness. Just as all general conditions were not enumerated, so only a few local causes will be mentioned.

One of the oldest diseases, glaucoma, causes about five times as much blindness as need be caused by this condition. An odd statement, yet most glaucoma blindness might be stayed from its destructive action if treatment were begun early. The exact causes of the several kinds of glaucoma have never been definitely established, although it is known that many factors are concerned in their production. The most malignant and at the same time most easily overlooked disease that the eye physician has to deal with, chronic simple glaucoma, exacts a high toll. This last type usually occurs in both eyes, without inflammation. The eyes are of normal appearance to a casual observer and the central vision remains good almost to the last stage of the disease. The greatest change lies in the loss of the peripheral fields, which may be markedly reduced before it is realized by the afflicted person. The eye eventually becomes stony hard, and the retina loses its function because of the intense pressure within. Like many another disease, chronic simple glaucoma may be successfully treated by medicine in its early stages, but in advanced cases blindness may ensue regardless of what steps are taken, although surgery offers much hope.

In contrast to most of the other diseases that have been mentioned, another disease, trachoma, is contagious and may easily be carried from one person to another unless due precautions are taken. It is difficult to predict the exact course of the disease for trachoma may advance either slowly or rapidly, and it sometimes results in complete blindness. However, blindness results not because the eyeball is lost, but usually because of an irritation of the conjunctiva, or pannus, which grows over the cornea. This disease is not peculiar to any one class of people, but is more prevalent in those groups which have less cleanly

*Rice, C. E: Cost and Loss from Syphilitic Blindness in the United States. Venereal Disease Information 20: pp 91-95, April, 1939.

habits and whose community life entails living very close together. With the newer methods of treatment, trachoma, if caught in its early stages, can be cured within a very short time.

Progressive myopia (near-sightedness) has caused more blindness than is commonly supposed. Like chronic simple glaucoma, it too may be highly malignant, resulting finally in almost total destruction of vision. While the eyeball itself is not lost as a rule, changes occur within the eye which render it unfit for service. Because the eyeball in such cases is larger than normal, sometimes the retina lining at the back of the eye cannot withstand all the abuse. Hence it detaches or separates from its bed. Detachment of the retina, occurring in patients with the high degrees of myopia, results in a great percentage of cases in the loss of vision needed for useful work. More myopic eyes with separated retina have been saved by operation than formerly, due to the improved methods of treatment, and operations for detached retina have restored sight to many an otherwise hopeless case.

Inasmuch as approximately a third of blindness is caused by cataracts, considerable attention may well be paid to this subject. The lens of the eye, a small bit of translucent tissue, becomes opaque so that light may not easily pass through. That is the entire story of cataract formation. This lens opacity may develop, as a person becomes older, the senile type of cataract; or it may develop as a result of injury, the traumatic type. Most of the cataracts included in this study are of the senile type, although there are a few instances where a traumatic cataract or a congenital type caused total loss of vision.

UNDETERMINED ETIOLOGY:

In a review of the Physicians' Eye Reports, it is realized that certain factual information valuable to a complete study is not available. The majority of afflicted persons had been blind for many years before they were examined. Memory of the past disease, even if all exact knowledge had ever been present, was inaccurate. Incomplete or misleading information was often given to the examining physicians, not with intent to deceive, but because of a lack of exact understanding on the part of the patient. A casual inquirer might question why so large a percentage were found in the "etiology undetermined." He would need only to examine actual patients carefully to realize why this has been necessary. Every examiner is aware that undue emphasis is sometimes placed upon the most trivial of supposed causes of blindness. Even the prophylactic silver nitrate at birth has been given as the cause of a disease which began months afterward. Again, the reports have given diseases as actual causes which obviously have no relationship as a cause of blindness, and these had to be reclassified as "etiology undetermined."

In the future, with less of a time interval between the actual onset of blindness and the preparation of the report by the medical examiner, fewer cases will be classed in "etiology undetermined." Inasmuch as all examiners are regularly accredited ophthalmologists, who profit by past experiences, future reports are expected to have more complete data from which better inferences may be drawn. In addition, improved methods of diagnosis and earlier treatment will furnish better results.

MAJOR ETIOLOGICAL CLASSIFICATION

Definite etiological* classifications of blindness were reported for 490 individuals. Of the 1083 for whom definite classification is not given, 898 have a topographical classification for which the etiology either is unknown to science at the present time or was extremely difficult to determine because the examination was made so long after the onset of blindness. The remaining 185 cases for which etiology is not given represent 11.8 percent of the total number.

Of the 490 cases in which an etiological cause of blindness is specified, 168, or 34.3 percent were caused by infectious disease, principally syphilis and trachoma. Syphilis appears less important as a cause of blindness in Washington than in other states. On our report only 54 such cases are noted. Dr. C. E. Rice of the Public Health Service estimated that this scourge caused about 15 per-

Table X. Number by Major Topographical Classification and by Major Etiological Classification of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Etiological Classification	Topographical Classification									
	Total		Eyeball (1&2)	Cornea (3)	Iris & Cil- iary Body (4)	Crystal- line Lens (5)	Choroid & Retina (6)	Optic Nerve (7)	Vitreous Humor (8)	Ill-defined (9)
	Num- ber	Per- cent								
All Classifications:	Number	1573	353	130	75	476	231	215	8	85
	Percent	100.0	22.4	8.3	4.8	30.2	14.7	13.7	0.5	5.
Infectious Diseases		168	16	54	4	8	21	53	1	1
Traumatic & Chemical Injuries:										
Non-industrial		51	11	5	13	10	2	9	1	
Industrial		32	13	2	2	5	3	-	1	
Not Specified		37	8	5	6	7	5	3	-	
Toxic Poisoning		3	-	-	-	1	-	1	-	
Necplasms		7	4	-	-	-	-	3	-	
Non-infectious Diseases		93	6	2	3	23	41	11	1	
Congenital & Hereditary		99	36	2	2	30	17	4	-	
Undetermined or not specified		1083	259	60	45	392	142	131	4	

cent of all the blindness throughout the nation. The percentage on this present report appears low, possibly because of the small number of people belonging to other than the white race in this State, but probably more especially because of

* The cause of blindness for each person was classified: first, according to the etiological or underlying cause of blindness and secondly according to the topographical classification or that part of the eye affected. In other words, a person may be considered to be blind because of syphilis (etiological classification) affecting the Cornea (topographical classification).

the etiological classification the youngest group are those whose blindness is due to congenital or hereditary causes. The next two youngest groups are those whose condition was caused by non-industrial injuries and infectious diseases. The median age of 69.5 years for the 1083 with undetermined or unspecified causes of blindness is the highest age for any etiological group. The groups whose blindness is due to non-infectious systemic diseases or to non-specified accidents also have median ages higher than the median age for the entire group.

ETIOLOGICAL CLASSIFICATION AND AGE AT ONSET:

As age increases, infectious diseases which had their onset at a previous time begin to cause blindness. Although the median age of onset of blindness for the entire group is 54.4 years, it is easily noted that blindness caused from specified industrial or non-industrial injuries is in a much younger group. The infectious diseases, syphilis, trachoma and a few others, cause blindness at a median age of 45, whereas the non-infectious systemic conditions have a median age of 60.

Table XII. Number by Major Etiological Classification and by Twelve Age Groups at Onset of Blindness of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Age at Onset		Etiological Classification									
		Total	Infectious Diseases (1&2)	Traum. & Chem.			Toxic Poisoning (5)	Neoplasms (6)	Non-infectious Systemic Dis. (7)	Congenital & Hereditary (8)	Undetermined or Not Specified (9)
				Non-Industrial (3)	Industrial (4)	Not Specified (49)					
All Ages;	Number	1573	168	51	32	37	3	7	93	99	1083
	Percent	100.0	10.7	3.2	2.0	2.4	0.2	0.4	5.9	6.3	68.9
Under 1 Year	70	7	1						1	39	22
1 - 2 Years	21	6	1							3	11
3 - 4 "	22	7	4		1	1				2	7
5 - 14 "	67	14	14						3	8	28
15 - 24 "	71	6	5		4	3		3	1	8	41
25 - 34 "	99	16			7	5			4	9	58
35 - 44 "	139	23	4		6	2		1	3	4	96
45 - 54 "	252	41	9		8	8	1		15	5	165
55 - 64 "	316	22	5		3	8	1	2	28	9	238
65 - 74 "	281	12	7			8		1	25	3	225
75 - 84 "	140	3			3	1	1		8		124
85 Years & Over	22					1			1		20
No Report	73	11	1						4	9	48
Median Age		54.4	45	38.3	39.8	54.	59	44	59.7	5.8	58.1

There is a difference of 12 years between median age at onset of blindness 54.4 years, and median present age, 66.5 years. The group whose blindness is due to congenital or hereditary causes have been blind for an average period of 35 years. The average periods of blindness for the other etiological groups are: industrial injuries, 22.5 years; neoplasms, 20.0 years; non-industrial injuries, 14.7 years; not-specified injuries, 13.5 years; undetermined or unknown etiology, 11.4 years; infectious and non-infectious diseases, 9.3 years; and toxic poisonings 7.0 years. If it had been possible to make a careful examination of the 1083 individuals whose etiology is unknown or undetermined soon after the blindness occurred, instead of an average of 11 years later, there would have been a greater possibility of accurately determining the etiological cause.

ETIOLOGICAL CLASSIFICATION AND RACE:

Although only a few Indians, numerically, have been declared blind, their percentage of blindness due to infectious disease is much higher than is found in other races. Trachoma is the chief evil in this classification. Many older aged Indians still have an infectious trachoma. Treatment for Indians, at present, is given principally to the children by the Indian Service.

Table XIII. Number by Major Etiological Classification and by Race, of Recipients of Blind Assistance February, 1936 to March, 1939, State of Washington

Etiological Classification	Race				
	Total	White	Negro	Indian	Other
All Classifications: Number	1573	1525	25	19	4
Percent	100.0	96.9	1.6	1.2	0.3
Infectious Diseases	168	154	2	9	3
Traumatic & Chemical Injuries:					
Non-industrial	51	51			
Industrial	32	31	1		
Not Specified	37	36	1		
Toxic Poisoning	3	3			
Neoplasms	7	7			
Non-infectious diseases	93	92	1		
Congenital & Hereditary	99	99			
Undetermined or not specified	1083	1052	20	10	1

ETIOLOGICAL CLASSIFICATION AND RESIDENCE:

Although in all classifications the ratio between blind persons who reside in urban centers and those in rural areas is 60 to 40, injuries caused blindness less often in the urban areas. There may be a possibility, although difficult of proof, that an injury which occurred in an urban area received the attention of an eye specialist more promptly and the final result was less damaging to the vision. Certainly there is as high a rate of accidents within the urban centers as in the rural areas.

The non-infectious systemic diseases, principally diabetes and the vascular diseases, were the cause of blindness slightly more often in the urban districts. Some credence may be given to the belief that cities exact their toll by a breakdown in the cardio-vascular-renal chain.

Table XIV. Number by Major Etiological Classification and Percentage Distribution by Residence of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Etiological Classification	R E S I D E N C E							
	Total		Urban		Rural		No report	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
All classifications	1573	100.0	916	58.2	615	39.1	42	2.7
Infectious Diseases	168	100.0	101	60.1	67	39.9		
Traumatic & Chemical Injuries:								
Non-Industrial	51	100.0	28	54.9	22	43.1	1	2.0
Industrial	32	100.0	16	50.0	16	50.0		
Not Specified	37	100.0	21	56.8	16	43.2		
Toxic Poisoning	3	100.0	3	100.0				
Neoplasms	7	100.0	4	57.1	3	42.9		
Non-Infectious Diseases	93	100.0	59	63.4	34	36.6		
Congenital & Hereditary	99	100.0	59	59.6	39	39.4	1	1.0
Undetermined & Not Specified	1083	100.0	625	57.7	418	38.6	40	3.7

ETIOLOGICAL CLASSIFICATION AND RECOMMENDATION FOR TREATMENT:

In the field of Prevention of Blindness, 11 percent of the infectious diseases might have been or may yet be helped. In addition, 15 percent of blindness from injury and 10 percent of the congenital and hereditary types may yield to some form of treatment even though the patient has very poor vision. Many more might have been helped if the pathological process had been treated earlier, before actual blindness occurred.

When those afflicted with conditions that cause blindness seek competent attention early, these percentages will change and fewer persons will be irrevocably blind.

Table XV. Number by Major Etiological Classification, and Percentage Distribution by Recommendation for Treatment of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Etiological Classification	Recommended for Treatment					
	Total		Yes		No	
	Number	Percent	Number	Percent	Number	Percent
All Classifications:	1573	100.0	255	16.2	1318	83.8
Infectious Diseases	168	100.0	19	11.3	149	88.7
Traumatic & Chemical Injuries:						
Non-Industrial	51	100.0	8	15.7	43	84.3
Industrial	32	100.0	2	6.2	30	93.8
Not Specified	37	100.0	3	8.1	34	91.9
Toxic Poisoning	3	100.0			3	100.0
Neoplasms	7	100.0			7	100.0
Non-Infectious Diseases	93	100.0	7	7.5	86	92.5
Congenital & Hereditary	99	100.0	10	10.1	89	89.9
Undetermined or not specified	1083	100.0	206	19.0	877	81.0

MAJOR TOPOGRAPHICAL CLASSIFICATION

In the preceding section the etiological or underlying causes of blindness have been discussed. In this section the topographical classification of blindness, or the location of the defect within the eye, is shown. Almost one-third (30%) of blindness is caused by cataract; that is, a change of the lens whereby it becomes opaque. Over one-fifth of the blindness is caused by some involvement of the eyeball as a whole, chief diseases being glaucoma (a stony hard eye), myopia (extreme near-sightedness), and a "wasted" eyeball. Atrophy of the optic nerve causes one-seventh of blindness, and it is probable that the greatest percentage of the atrophies are due either to syphilis or to glaucoma.

Appendix Table F presents the major topographical causes of blindness for each county. As a result of surgery done on the lens previous to inauguration of the present program, King County has less blindness due to lens opacities than have other counties.

Table XVI. Number and Percentage Distribution by Major Topographical Classification of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Topographical Classification	Number	Percent
Total	1573	100.0
Eyeball	353	22.4
Conjunctiva	-	-
Cornea	130	8.3
Iris & Ciliary Body	75	4.8
Crystalline Lens	476	30.2
Choroid & Retina	231	14.7
Optic Nerve	215	13.7
Vitreous Humor	8	0.5
Miscellaneous & Ill-Defined	85	5.4

TOPOGRAPHICAL CLASSIFICATION AND AGE:

Degenerative diseases affect the eye just as they do the rest of the body. It may be noted that degenerative changes affecting such structures as the lens, eyeball, or choroid occur principally in the older age groups. The eye may be involved indirectly by senile blood vessel changes. A variation in the physical condition of the entire body may cause a lowered nutrition and resultant definite pathological changes.

Table XVII. Number by Major Topographical Classification and by Eight Age Groups of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Present Age	Topographical Classification								
	Total	Eyeball (1)	Cornea (3)	Iris & Ciliary Body (4)	Crystal-line Lens (5)	Choroid & Retina (6)	Optic Nerve (7)	Vitreous Humor (8)	Ill-defined (9)
All Ages	1573	353	130	75	476	231	215	8	85
24 Years & Under	26	6	2	2	9	-	5	-	2
25 - 34 Years	83	20	3	9	17	9	16	-	9
35 - 44 "	83	19	11	8	10	18	13	-	11
45 - 54 "	186	36	20	14	28	30	41	3	14
55 - 64 "	308	72	31	17	50	52	71	1	14
65 - 74 "	371	104	23	14	117	56	38	2	17
75 - 84 "	380	74	33	9	168	49	26	2	19
85 Years & Over	136	22	7	2	77	17	5	-	6
Median Age	66.5	66.4	63.25	56.3	74.5	65.4	58.9	63.0	64.1

TOPOGRAPHICAL CLASSIFICATION AND AGE AT ONSET:

Certain structures of the eye fail before others. Disease of the iris and ciliary body resulted in blindness at a younger age than did changes within the cornea or atrophy of the optic nerve. Moreover, degenerations of the delicate retina and choroid, which were the accompaniment of general systemic diseases, resulted in blindness at an earlier age than did involvements of the eyeball as a whole, such as myopia or glaucoma. The one condition responsible for most blindness that occurred in the oldest age group (85 years or over) was some change with the lens, and it is for this condition that surgery at the present time offers the best hope for restoration of vision.

There was a lapse of 21 years between age at onset and the present for the 85 involvements listed as Miscellaneous or Ill-Defined. Probably if examination had been made soon after the onset of blindness it would have been possible for the examining physician either to elicit better information from the patient or to examine the eye better. The shortest period of time between age at onset and present age is 11 years for involvements of the lens and optic nerve.

The average time between age at onset and present age for the other topographical classifications is: cornea, 16 years; vitreous humor and choroid and retina, 14 years; and iris and ciliary body and eyeball, 12 years.

Table XVIII. Number by Major Topographical Classification and by Twelve Age Groups at Onset of Blindness of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Age at Onset		Topographical Classification								
		Total	Eyeball (1)	Cornea (3)	Iris & Ciliary Body (4)	Crystalline Lens (5)	Choroid & Retina (6)	Optic Nerve (7)	Vitreous Humor (8)	Ill-defined (9)
All Ages:	Number	1573	353	130	75	476	231	215	8	85
	Percent	100.0	22.5	8.3	4.8	30.2	14.7	13.7	0.5	5.4
Under 1 Year		70	23	8	0	18	8	6	0	7
1 - 2 Years		21	4	3	1	5	2	5	0	1
3 - 4 "		22	7	3	3	4	1	3	0	1
5 - 14 "		67	10	9	6	10	12	13	1	6
15 - 24 "		71	19	8	7	13	9	8	0	7
25 - 34 "		99	25	10	5	14	15	20	1	9
35 - 44 "		139	22	15	14	21	25	28	2	12
45 - 54 "		252	54	18	22	49	49	51	0	9
55 - 64 "		316	85	23	9	96	46	45	1	11
65 - 74 "		281	58	18	4	140	34	17	1	9
75 - 84 "		140	27	4	1	71	19	7	2	9
85 Years & Over		22	3	0	1	12	2	2	0	2
No Report		73	16	11	2	23	9	16	0	2
Median Age		54.4	54.7	47.3	44.3	63.7	51.6	48.3	49	43.5

TOPOGRAPHICAL CLASSIFICATION AND RESIDENCE:

Table XIX. Number by Topographical Classification and Residence and Percentage Distribution by Residence of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Major Topographical Classification	Residence							
	Total		Urban		Rural		No Report	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
All Classifications	1573	100.0	916	58.2	615	39.1	42	2.7
Eyeball	353	100.0	202	57.2	150	42.5	1	0.3
Cornea	130	100.0	76	58.5	54	41.5		
Iris & Ciliary Body	75	100.0	51	68.0	24	32.0		
Crystalline Lens	476	100.0	244	51.3	192	40.3	40*	8.4
Choroid & Retina	231	100.0	135	58.4	96	41.6		
Optic Nerve	215	100.0	153	71.2	61	28.4	1	0.4
Vitreous Humor	8	100.0	1	12.5	7	87.5		
Miscellaneous and Ill-Defined	85	100.0	54	63.5	31	36.5		

* Information not available for 40 persons receiving surgery and treatment only.

The proportion of blind people who reside in urban compared to rural areas is approximately 60 to 40 throughout most of the topographical classifications. Blindness due to involvement of the optic nerve and to changes of the iris and ciliary body occurs more frequently to those people who live in the urban areas. The reason for the preponderance of these conditions within the city districts is not apparent.

TOPOGRAPHICAL CLASSIFICATION AND RECOMMENDATION FOR TREATMENT:

The physicians who made the original examinations believed that one-third of the blind applicants whose blindness was due to defect of the crystalline lens might be helped by some treatment for the lens. The lens is the structure best adapted to intra-ocular surgery, whereas the choroid and the optic nerve are not easily operated upon. Most of the restorative surgery that is done for the eye is performed upon the lens. Vision is nearly always improved after a cataract operation and almost every time the ability to read is restored and there is a return to former independent self-sustaining habits.

Table XX. Number by Topographical Classification, and Percentage Distribution by Recommendation for Treatment of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

Major Topographical Classification	Total Number Percent		Recommended for Treatment			
			Yes		No	
			Number	Percent	Number	Percent
All Classifications	1573	100.0	255	16.2	1318	81.6
Eyeball	353	100.0	29	8.2	324	91.8
Cornea	130	100.0	12	9.2	118	90.8
Iris & Ciliary Body	75	100.0	8	10.7	67	89.3
Crystalline Lens	476	100.0	176	37.0	300	63.0
Choroid & Retina	231	100.0	14	6.1	217	93.9
Optic Nerve	215	100.0	13	6.1	202	93.9
Vitreous Humor	8	100.0	1	12.5	7	87.5
Miscellaneous & Ill-Defined	85	100.0	2	2.4	83	97.6

TREATMENT BY MEDICAL AND SURGICAL MEANS

The Division for the Blind has been given a responsibility by the Legislature for restoration and maintenance of vision by either surgery or other treatment, as well as for prevention of blindness. In facing this responsibility, it was found that there were persons receiving public assistance, and others who would soon be in need of such assistance, whose sight might be restored by surgery.

This program has restored a number of individuals to a self-supporting basis and for many a person it has made possible the enjoyment of more normal living without the necessity of undue dependence on other people.

During the 1937-1939 biennium, surgery and other treatment was given to 113 individuals. In making the selection of these 113, those were taken -- in addition to emergency cases -- who could be expected to benefit most by early treatment, leaving for the next biennium the many others who might benefit.

At the time of operation, three-fourths of those operated upon were dependent upon some type of public assistance: one-fourth upon Old Age Assistance, one-fourth upon Blind Assistance, and one-fourth upon other types of Assistance. The remaining fourth were not dependent upon Public Assistance, but were those who, while self-supporting, did not have sufficient income to finance this care and still maintain themselves.

These 113 patients received 152 operations. Obviously one operation may not be sufficient to clear a condition and a second or third operation may be necessary. In a few instances, two eyes have been operated upon in one individual because the status was such that to have operated upon only one eye would have not returned the person to fair working condition, or else would have brought about improvement in one eye while allowing the other to become progressively worse.

In addition to these operations, ten series of treatments were given in an endeavor either to prevent vision from becoming lost or to protect what little vision remained. Five series of treatment were given for glaucoma, two for trachoma, and one each for keratitis, eye injury, and ophthalmia neonatorum.

Appendix table G shows the county of residence of the persons receiving surgery, which in most instances is also the county in which surgery is performed. Occasionally a person living in one county may go to another county for surgery.

King County, the largest county, had provisions for treatment of eye conditions through its County Hospital at Seattle before the present program was put into effect. This accounts, partly, for the low total number of operations for that particular county.

Table XXI. Number of Operations and Treatments and Number, by Relief Status, of Persons Served Through Prevention of Blindness Program, June, 1937, to March, 1939, State of Washington

	Number	Percent
Total Individuals	113	100.0
Blind Assistance	30	26.5
Old Age Assistance	28	24.8
Other Relief	25	22.1
Non-Relief	30	26.6
Number of Operations	152	
Number of Treatments	10	

Table XXII and Appendix Table H analyzes in greater detail the number of operations shown in Table XXI. More than one-half the total operations to improve or retain vision have been for the removal of cataracts. Of these, 75 percent have been successful in restoring useful vision. Approximately one-eighth of the operations were iridectomies, which were usually done in cases where the diagnosis was glaucoma. For another one-eighth, it was found necessary to enucleate (remove) the eyeball. Enucleations were never done until a second eye surgeon, through consultation, agreed that it was the only means of saving the sight of the other eye, and sometimes the life of the person. The remaining one-fifth received operations which consisted principally in needling, removal of pterygia, and trephine operations.

Table XXII. Number, by type of Operation Given through Prevention of Blindness Program, June, 1937, to March, 1939, State of Washington

Type of Operation	Number	Percent
Total Operations	152	100.0
Catarract: Total	85	55.9
Successful	64	75.3
Unsuccessful	21	24.7
Enucleation	18	11.9
Iridectomy	19	12.5
Pterygium	7	4.6
Needling	11	7.2
Trephine	4	2.6
Other	8	5.3

FINANCIAL SAVINGS EFFECTED BY SURGICAL OPERATIONS:

Although the primary purpose of this program is to restore vision and thus make it possible for persons now blind to live a more nearly normal life, it may be that some evaluation of the program from a financial point of view is in order. The first 71 operations, approximately half of those performed during the biennium, were selected for analysis. In contrast to a ratio of three persons from public assistance rolls to one from non-relief status for the entire 152 operations, this contained two from public assistance rolls to one of non-relief status.

The total cost of these 71 operations including hospitalization and glasses, when necessary as part of post-operative care, was \$6,171, an average of \$86.91 per case. The range of individual cost was from \$49 to \$320 per case.

By the end of the biennium, 13 of the 47 public assistance cases had resulted in savings of \$2,733, due either to the reduction in or discontinuance of public assistance. This is an amount 85 percent in excess of the cost of the 13 operations, which totaled \$1,476. This saving of \$2,733 is also equal to 44 percent of the total cost of all the 71 operations.

An additional group of seven cases whose operations totaled \$631 are liquidating their cost at a rate of \$22.50 per month, a rate which will almost effect sufficient savings during the following biennium to pay for the cost of the operations. The remaining 27 operations for persons dependent upon public assistance and the 24 operations for non-relief persons did not result in any monetary savings to the division but in infinite greater comfort and happiness to the persons concerned.

Based upon the experience of these first 71 operations, the monthly savings to the department, after the savings on each case had paid for itself, might be estimated as between \$700 and \$750 or a biennial amount of from \$17,000 to \$18,000.

Choroiditis	Retinitis	Chorioretinitis	Detached retina	Retinal hemorrhage	Retinal degeneration (incl. pigmentosa)	Obstructions of the central artery or vein	Other affections of choroid and retina, spec.	Affections of choroid and retina, not spec.	OPTIC NERVE	Optic atrophy	Optic neuritis	Neuroretinitis	Other affections of optic nerve, specified	Affections of optic nerve, not specified	VITREOUS HUMOR	Intra-ocular hemorrhage	Opacities	Other affections of vitreous humor, spec.	Affections of vitreous humor, not spec.	MISCELLANEOUS AND ILL-DEFINED	Amblyopia, undefined	Other ill-defined lesions, specified	Lesions, not specified
610	620	630	640	650	660	670	680	690		710	720	730	780	790		810	820	880	890		910	980	990
36	50	49	21	15	48	1	9	2	215	193	9	4	6	3	8	3	5			85	10	9	66
2.3	3.2	3.1	1.3	1.0	3.1	*	0.6	0.1	13.7	12.2	0.6	0.3	0.4	0.2	0.5	0.2	0.3			5.4	0.7	0.5	4.2
4	3	12		1	1				53	49	2			2	1		1			11			11
									1		1												11.
		3																		1		1	12.
									5	4				1						5		5	13.
									3	2	1												14.
2	1	1							5	5													15.
1	2	6			1				37	36				1						4		4	16.
																1		1					17.
		2							2	2													18.
1			1																				19.
1		1	7				1		12	12					2	2				9	1	2	6
																							31.
1									1	1													33.
									3	3													34.
		1														1	1						35.
																							36.
									2	2													37.
									3	3													38.
																							39.
			2				1									1	1			6	2	4	41.
																							42.
																							48.
		1	4						3	3										3	1	2	49.
									1	1										1	1		
																							51.
																							52.
																							53.
																				1	1		58.
																							59.
									3														

* LESS THAN 0.1 %

Causes of Blindness, Topographical by Etiological Classification of Recipients of Blind Assistance, February, 1936, to March, 1939, State of Washington

ALL CAUSES—ETIOLOGICAL		No.		ALL CAUSES—TOPOGRAPHICAL																				CONJUNCTIVA		CORNEA		LACRIMAL GLANDS		GLAUCOMA		CATARACTS		RETINA		CHOROID AND RETINA		OPTIC NERVE		Other		TOTAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
ALL CAUSES—ETIOLOGICAL		1573	100.0	22.4	121	4.1	0.1	*	*	0.1	0.1	0.1	0.1	0.8	0.2	2.2	0.6	0.4	0.2	0.3	0.6	130	8.3	0.5	0.1	0.5	2.9	1.2	2.6	0.5	4.8	18	0.8	1.8	0.3	30.2	2.9	0.1	0.2	14.7	2.3	3.2	3.1	1.3	1.6	3.1	0.6	0.1	1.1	53	49	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

* LESS THAN 0.1%

APPENDICES

A. FORM FOR PHYSICIAN'S REPORT ON EYE EXAMINATIONS

In an endeavor to perfect the blank used in the State of Washington for the physician's report of eye examination, the forms for such reports used in fifteen other states were studied and compared. Many states used identical reports, which were duplicates of those used in Washington several months ago, but certain other states, notably Colorado and Pennsylvania, were using a much more adequate form. On the basis of these comparisons, it was concluded that the Washington report was inadequate for judging eye conditions. The present form, prepared early in 1938 after several revisions, embodies the best features of the numerous other forms studied.

It is believed that if every item in this present report is filled out completely, most of the pertinent information about any case will be evident. Manifestly it is often very difficult for the committee who review the reports to judge an eye condition from the report alone. A facsimile of the form is included in this pamphlet, reference to which will show where it would be very helpful if more complete data were always given. Some items upon the report form are self-evident and require no explanation, such as the name of the applicant and the address, including the county of residence. Certain other points deserve further explanation.

DATE OF BIRTH

Age is of considerable importance in deciding such matters as possible treatment or eligibility for blind assistance. A young person may receive treatment which would not be applicable to an older person. If the person being considered is under twenty-one, he may be eligible to attend the State School for the Blind at Vancouver and, therefore, not eligible to receive blind assistance. While special training for all blind is desirable, there is a greater need in the case of younger persons because of their longer life expectancy. Age is also a factor in considering certain operative procedures.

AGE AT ONSET OF BLINDNESS

On the blank are two spaces, one for each eye, to note the age when blindness occurred in that eye. It is of value to indicate the approximate age when blindness was noticed by the person. For example, assume the vision of the right eye to have been reduced to 10/200 because this eye turned inward, while showing no demonstrable intra-ocular pathology, and the condition to have been of fifty years' duration. If the left eye then suddenly develops a chorioretinitis, the "cause of blindness" is only the "chorioretinitis"; yet the latter diagnosis alone would not reveal all the important facts. Again, if there had been no vision in the right eye for eight or ten years because of a hemorrhagic retinitis and the left eye slowly developed a senile cataract, the latter diagnosis would be accepted as the only cause of blindness; but, obviously, it would be incomplete, for an entirely different cause was responsible for the blindness of the first eye.

EYE CONDITION PRIMARILY RESPONSIBLE FOR BLINDNESS

This item may contain two classifications: the etiological and the topographical (the cause and the location of the lesion that has resulted in blindness). As reports are scrutinized by staff workers, a code number is given to each item in the classification so that all reports may be easily tabulated. The first half of the code number is for the site, the second half for the cause. The code numbers for the different classifications are shown on the two page table near the center of the booklet. This standardized classification is used in the State of Washington, as in most other states, for summarizing data. This system has been adopted because it is simple and easy to use. Complete in its arrangement, it throws proper emphasis upon the etiological factor. If it is used when preparing eye reports, much confusion will be avoided and the data will be easier to systematize. Only by the use of such a uniform method of grouping can information be compiled that will be useful in preventing future blindness.

Eye reports that record a complete diagnosis enable the Division of the Blind to tabulate statistical information accurately. This prepared data may be of definite interest to the eye physicians of this state as well as to the national organizations. It also enables the Division of the Blind to plan more adequately for a prevention of blindness, as well as a restorative treatment program.

DESCRIBE THE APPEARANCE OF THE EYE

A clear description of the appearance of the eyes is of inestimable value in certain types of blindness. With a poor description on which to judge an eye condition, the person going over a group of eye reports may be forced in certain instances to hazard a mere guess. Often an adequate description may disclose a contributing cause of blindness which may have an important bearing upon later proposed treatment.

CENTRAL VISUAL ACUITY

This is probably the most important single entry applicable in all cases. The Law of 1937, the part of which concerned with vision has not been changed, designates that the question of whether a person is blind or not is to be determined by whether or not he has "vision insufficient to do ordinary tasks for which eyesight is essential."

In accordance with the standards previously set by the American Medical Association, a vision in the better eye of 20/200 feet or 6/60 meters, or less, with proper correction, is usually considered as "economic blindness". However, each case is considered separately in determining eligibility for financial assistance to blind. Occupation always plays a part in such a decision. A vision of 20/200 is not as great a handicap for a farmer as 20/70 vision is for a watch maker. The State of Washington is in agreement with thirty-three other states in admitting that an economic blindness usually comes with a vision of 20/200 in the better eye, although Pennsylvania and Wyoming determine an economic blindness upon a 10/200 basis. For several reasons, a percentage classification is not as desirable as a Snellen notation, chiefly because the distance from the testing chart is not given and the percentages may be misinterpreted. If the vision is not as good as 20/200, sometimes such a statement is made as "0"/200. This may be very misleading, since the vision may not be "20"/200 but may be "10"/200, which is less than 20/200, although obviously better than "no vision" or "0"/200. If vision is not 20/200, perhaps it may be

10/200 or 3/200, a closer distance than twenty feet being used to determine perception of the "200 foot" sized letter. If the "200 foot" letter cannot be seen at any distance, shadows of the hand or perception of light may be acknowledged, and this indicates better vision than the mark "O" or "Nil" or "Blind". Contracted fields or restricted muscle rotation in some extreme instances may cause a person to be eligible for Assistance to the Blind even when the central vision is as good as "20/200", provided he is otherwise eligible.

NEAR VISION

Although "near" vision is not a factor in most cases, in extreme myopia, malingering, and some other cases, data on "near" vision is important in considering the patient's eligibility for assistance. It is desirable that the reading card issued by the American Medical Association be used because it is a standardized universal card.

Near vision charts were designed before those for distant vision but their methods of use and application have not been developed in as uniform a manner as for the charts for distant vision. The so-called "Jaeger" designation for reading cards is wholly unreliable as regards uniformity. Some cards are issued with Jaeger No. 1 as the smallest size printing, or three point type, while other Jaeger cards use the No. 1 designation to mean the largest size printing, or 110 point type. Originally Jaeger designations ran from No. 1 to No. 20, ranging from 3 point print of .5 mm. to 110 point print of 19.5 mm. Another means of designation is simply to number the lines of type on the card from 1 to 20, without reference to any standard of size.

The type size of the American Medical Association card has been designed to subtend a specified visual angle at 14 inches. It may well be used as the standard reading card so that, if a blind person is examined by one physician and at a later time by another physician in another part of the state or even another part of the United States, the latter will know exactly what the previous examining physician found at the time of his observation. All near reading cards should have approximately 10 foot candles of illumination while the test is being made.

LIGHT PROJECTION

Light projection as well as color localization of a cataract eye are often the points that determine the advisability of performing an operation and, therefore, should be recorded on the eye report. Projection of a light upon the retina helps to determine the condition of the retina, optic nerve or the upper visual center. Faulty or poor light projection often means a diseased retina, and this information must be available from the record before a decision can be made regarding removal of a cataract. Accurate localization of a small light and the recognition of red and green colors provide fair criteria that the eye is suitable for a cataract operation.

INTRA-OCULAR TENSION

Knowledge of the patient's intra-ocular tension is important to the completeness of the report, for example, in a diagnosis of "glaucoma". Finger tonometry has long been used in estimating how hard an eyeball may feel, but the method is inaccurate at best; and when the seriousness of such a disease as glaucoma is considered, it is

realized how desirable is an instrument for accurate measurement. Even an instrument is not always standardized. A study was made of several different Schiotz tonometers in good working order by using them to measure the tension of several hundred eyes, and this showed that different instruments often gave slightly different readings upon the same eye. Each tonometer has a normal of its own, so that no table of exact equivalents can be made for the Bailliart, Schiotz, and McLean tonometers. While tonometers give a closer estimation of intra-ocular pressure than the "finger test", the "finger test" should be made and recorded on the eye reports in the event that a tonometer is not used.

PERIPHERAL VISION

Field charting is not usually included on state reports, only a few other states asking for "fields". Nevertheless, an altered field is sometimes the basis for granting Assistance to the Blind. Plotting of the field is not indicated for every case but for certain diseases, such as glaucoma, retinitis pigmentosa or optic atrophy, the report upon the "fields" is indispensable. The "projected" method of registration is used, not the "anatomic"; the "projected" method having the advantage of enabling the operator to place himself, by a quick glance, in the same position as the patient when the field was taken. Optimal illumination of a perimeter is about 7 to 10 foot candles and of the Bjerrum screen, about 10 foot candles. Some means of testing or determination is desirable in all cases where changed fields are found.

REMARKS OR COMMENTS

Under this heading may be included any desirable information not recorded elsewhere in the report. A comment of the examiner when he suspects malingering will be helpful, for in such case repeated examinations may be advisable. Invalidism of the patient should also be noted, to be considered when advising a reexamination.

Consultation with another eye physician is sometimes necessary when the Division of the Blind considers an individual report. Consultations are never advised to discredit the examiner, but are occasionally desirable to substantiate the previous findings if the applicant is dissatisfied with one report or if the Department wishes confirmation. Obviously, when two or more reports agree, a definite opinion on the case may be formed.

RESTORATIVE AND PREVENTIVE TREATMENT

Restorative and preventive treatment for these blind applicants is handled exclusively by physicians who restrict their practice to eye, or eye, ear, nose and throat and who are so registered in the American Medical Directory. Excellent progress has been made, and with the continued cooperation of eye physicians throughout the state, valuable information regarding the conditions which lead to blindness can be made available. This, in turn, will serve a real need to those who are interested in planning effective measures to prevent blindness in the future.

Applicant's name Sex Race

Date of birth..... Age at onset of blindness: Right eye..... Left eye.....

Eye condition primarily responsible for blindness in each eye:

Secondary conditions if any

Etiological factor responsible for primary eye condition.....

If there is a history of eye injury, state type and date.....

Describe each eye, including if possible: Sclera, cornea, iris, pupil, lens, vitreous, retina, choroid, optic nerve.

Without Glasses

Distance (20 ft.) Near (14 in.)

With Glasses
Distance (20 ft.) Near (14 in.)

Use Snellen notations in recording visions such as 20/70, 20/200, 10/200, 5/200.

Right eye:

Left eye:.....

Can vision be improved by new glasses?..... If yes, to what extent?..... Approximately what correction?

Right eye:.....

Left eye:.....

If vision is not sufficient to be noted by test card, record the distance at which fingers may be counted or where hand movements can be seen, or note if shadows can be observed, or if there is light perception.

Use AMA or similar reading card in determining near vision. State which reading card used.

If cataract is cause of blindness, state condition of light projection and localization of red and green colors:

Right eye: Left eye:

Intra ocular tension, tonometer (state which kind) or fingers, denoted by 1 plus, 2 plus, 3 plus, 4 plus:

Right eye:..... Left eye:.....

Previous operative work upon eyes and dates.....

PERIPHERAL OR CENTRAL VISION:

Peripheral field vision to be recorded only when needed as a factor in blindness on persons whose central vision is so great as to render them ineligible for aid to the blind in the state and yet by rough test show a marked field defect.

Central field vision to be charted only for certain cases, such as optic atrophy, retinitis pigmentosa, some types of glaucoma, or other conditions where indicated.

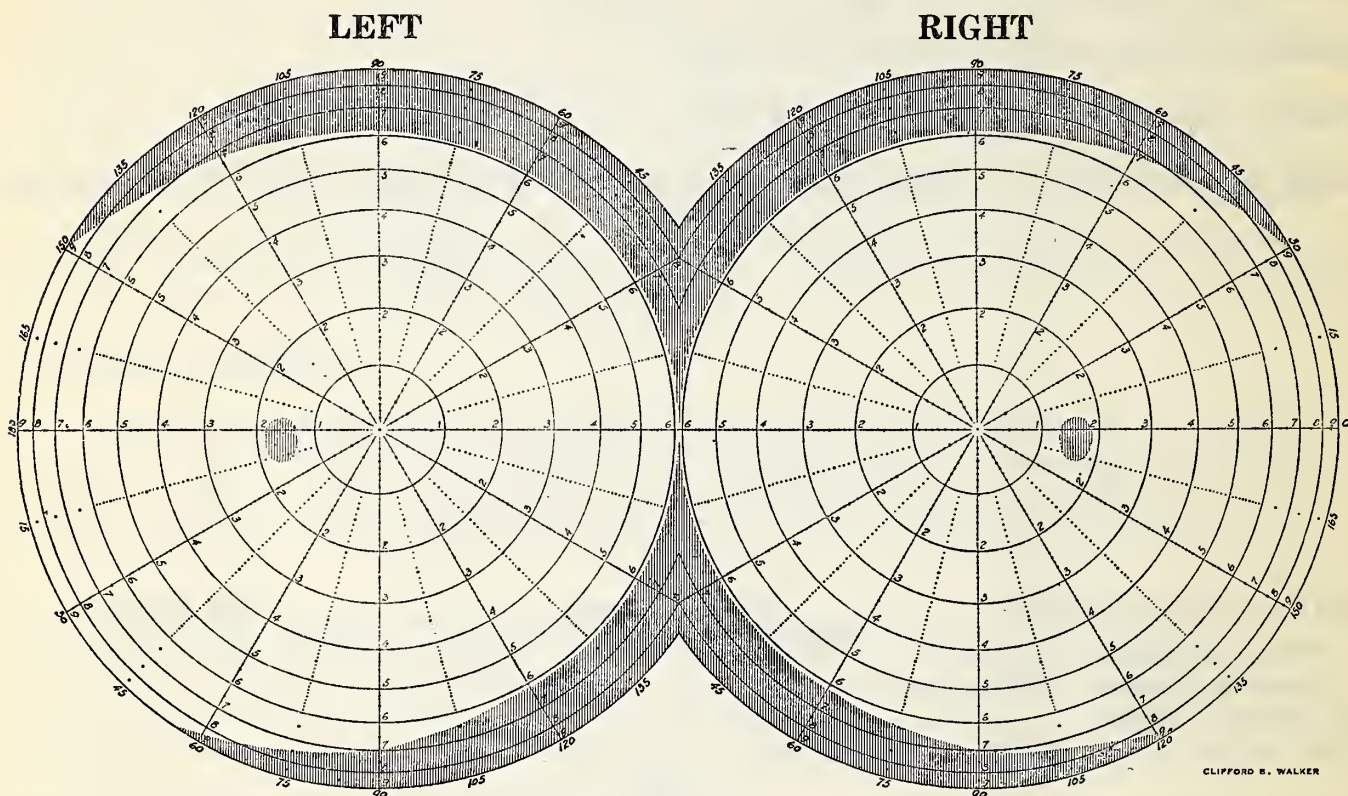
Peripheral field vision should be done on a standard perimeter with a radius of 13 in. and a white test object 6 mm. in diameter. The test object should be of such size that it subtends an angle of approximately one degree.

If there are any peripheral field changes, indicate on this chart, taken without correction if possible. Note the radius of perimeter, size of test object, and illumination.

If central field vision is charted, note distance of patient from testing screen, size of test object and illumination.

Is there any limitation in the field of vision?.....

Explain



Prognosis: Is there any likelihood that vision could be restored by operation or treatment?

Recommendations for primary eye condition.....

Recommendations for etiological condition.....

Remarks or comments: When should applicant be reexamined?

Date of examination.....

(Signature of eye physician)

Date of report.....

(Address)

B. METHODOLOGY OR COMPILATION OF STATISTICS

All persons who were accepted for Blind Assistance grants by the county or state department from February 1, 1936, through March 31, 1939, and for whom there were available both a social data card and a physician's eye report, were included in this study. During the months of February and March, 1936, records for persons receiving Public Assistance grants for the Blind from the County Welfare Departments were collected by the State Department of Public Welfare; although no cases were presented for Federal matching until April, 1936.

When the social data cards were installed in November, 1936, to be used as a basis for annual reports to the Social Security Board regarding the characteristics of persons accepted for care, an attempt was made to obtain cards for all persons accepted prior to November, 1936. Both social data cards and physician's eye reports were collected for all but 71 of these individuals accepted early in 1936. As these persons had either not been accepted for Federal matching or had ceased to receive grants before November, 1936, it was impossible to obtain the necessary records for inclusion in this study. After adjustments were made for transfers between counties, 1,533 acceptable schedules remained for tabulation. To these were added 40 physician's eye reports for persons (not included above) with vision of 20/200 or less who had been accepted for surgical or other treatment under the prevention of blindness program. All other persons accepted for treatment or surgery had vision in one or both eyes of better than 20/200.

The data on the physician's eye reports, such as age at onset of blindness, degree of blindness, recommendation for treatment, and the topographical and etiological factors of blindness are routinely transferred to the back of the social data card which is filled out for each person accepted for blind assistance. These data are transferred to a Holerith card at the same time as the required data are punched. The information from these two sources has been combined upon the same Holerith card in order that the diagnosis and other medical information may be easily related to the various social characteristics reported upon the social data card.

The one disadvantage in utilizing these cards for such a study is the situation caused by the change made in the social data cards in July, 1937. This change made it unwieldy to punch the same type of information in identical columns, and, consequently, the present study is based on two groups of cards, 1,005 on the old group and 568 on the new group. The double posting necessary for each item was somewhat cumbersome when making tabulations of age by single years of age. (This was necessary as the social data cards have the year of birth and not the age at time of acceptance entered upon them.)

This same item, birth date instead of age, was the basis of a decision to compute age at present time for all persons instead of age at time of acceptance. For the persons who were examined early in the program this method caused the age to be computed from one to three years in excess of age at time of application. However, age at onset of blindness was computed for each person and entered upon the schedule.

Coding of the topographical and etioloical classifications of causes followed the procedures recommended by the Committee on Statistics of the Blind.*

* Sponsored jointly by the American Foundation for the Blind and the National Society for Prevention of Blindness. Copies may be obtained by addressing Miss C. Edith Kerby, National Society for Prevention of Blindness, 50 West 50th, New York City.

C. SUPPLEMENTARY TABLES

Table A. Number by County and by Sex of Recipients of Blind Assistance. - February 1936 to March 1939
State of Washington.

County	Total	Male	Female
All Counties	1573	969	604
Number	100	61.6	3.84
Percent			
Adams	2	2	0
Asotin	2	1	1
Benton	13	7	6
Chelan	32	19	13
Clallam	32	21	11
Clark	40	18	22
Columbia	7	5	2
Cowlitz	41	23	18
Douglas	12	10	2
Ferry	2	1	1
Franklin	6	5	1
Garfield	5	4	1
Grant	7	6	1
Grays Harbor	62	44	18
Island	10	4	6
Jefferson	9	2	7
King	411	252	159
Kitsap	28	19	9
Kittitas	16	12	4
Klickitat	7	3	4
Lewis	76	40	36
Lincoln	4	2	2
Mason	12	9	3
Okanogan	16	12	4
Pacific	17	10	7
Pend Oreille	10	9	1
Pierce	153	92	61
San Juan	2	1	1
Skagit	36	24	12
Skamania	8	4	4
Snohomish	91	62	29
Spokane	87	54	33
Stevens	14	11	3
Thurston	62	29	33
Wahkiakum	2	1	1
Walla Walla	26	14	12
Whatcom	115	77	38
Whitman	8	5	3
Yakima	90	55	35

Table B. Number by Fourteen Age Groups and Sex and Percentage Distribution of Recipients of Blind Assistance, February, 1936, to March, 1939, State of Washington

Age	Both Sexes		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Total	1573	100.0	969	100.0	604	100.0
24 years & under	26	1.7	17	1.8	9	1.5
25 - 29 years	44	2.8	30	3.1	14	2.3
30 - 34	39	2.5	24	2.5	15	2.5
35 - 39	47	3.0	33	3.4	14	2.3
40 - 44	36	2.3	27	2.8	9	1.5
45 - 49	74	4.7	43	4.4	31	5.1
50 - 54	112	7.1	81	8.3	31	5.1
55 - 59	143	9.1	92	9.5	51	8.5
60 - 64	165	10.5	111	11.5	54	9.0
65 - 69	207	13.1	120	12.4	87	14.4
70 - 74	164	10.4	104	10.7	60	9.9
75 - 79	203	12.9	116	12.0	87	14.4
80 - 84	177	11.3	100	10.3	77	12.7
85 years & over	136	8.6	71	7.3	65	10.8

Table C. Number by Eight Age Groups and Percentage Distribution by Recommendation for Treatment of Recipients of Blind Assistance, February, 1936, to March, 1939, State of Washington

Age	Recommended for Treatment					
	Total		Yes		No	
	Number	Percent	Number	Percent	Number	Percent
All Ages	1573	100.0	255	16.2	1318	83.8
24 yrs. & under	26	100.0	2	7.7	24	92.3
25 - 34 years	83	100.0	9	10.8	74	89.2
35 - 44	83	100.0	12	14.5	71	85.5
45 - 54	186	100.0	21	11.3	165	88.7
55 - 64	308	100.0	40	13.0	268	87.0
65 - 74	371	100.0	78	21.0	293	79.0
75 - 84	380	100.0	72	19.0	308	81.0
85 yrs. & over	136	100.0	21	15.5	115	84.5

Table D. Number by Country of Birth and Percentage Distribution by Geographical Groups of 374 Foreign-Born Recipients of Blind Assistance - February, 1936, to March, 1939, State of Washington

<u>Country</u>	<u>Number</u>	<u>Percent</u>
Total	374*	100.0
Northwestern Europe:	176	47.1
England	31	
Scotland	7	
Wales	5	
Ireland	19	
Norway	51	
Sweden	41	
Denmark	10	
Netherlands	3	
Switzerland	9	
Central Europe:	66	17.6
Germany	36	
Poland	8	
Austria-Hungary	13	
Yugoslavia	9	
Eastern Europe:	38	10.2
Russia	23	
Finland	14	
Turkey	1	
Southern Europe	12	3.2
Greece	5	
Italy	7	
Canada	70	18.7
Other:	12	3.2
Iceland	8	
Asia	2	
Mexico	1	
Australia	1	

* All are white except one negro born in Russia and one Indian born in Canada.

Table E. Number by Major Etiological Classification and by Counties, of Recipients of Blind Assistance, February, 1936 to March, 1939, State of Washington

County	Total	Etiological Classification								
		Infectious Diseases (1&2)	Traum. & Chem.			Toxic Poisonings (5)	Neoplasms (6)	Non-Infectious Systemic Dis. (7)	Congenital & Hereditary (8)	Undetermined or Not Specified (9)
			Non-Industrial (3)	Industrial (4)	Not Specified (49)					
All Counties: Number	1573	168	51	32	37	3	7	93	99	1083
Percent	100.0	10.7	3.2	2.0	2.4	0.2	0.4	5.9	6.3	68.9
Adams	2	0	0	1	0	0	0	0	0	1
Asotin	2	0	0	0	0	0	0	1	0	1
Benton	13	1	2	0	0	0	1	1	1	7
Chelan	32	2	0	0	0	0	0	3	0	27
Clallam	32	2	1	2	1	0	0	2	5	19
Clark	40	7	2	1	0	0	0	4	2	24
Columbia	7	1	1	0	0	0	0	1	1	3
Cowlitz	41	2	3	1	0	0	0	2	3	30
Douglas	12	1	0	0	0	0	0	0	2	9
Ferry	2	0	0	0	0	0	0	0	0	2
Franklin	6	0	0	0	0	0	0	2	0	4
Garfield	5	0	0	0	0	0	0	0	1	4
Grant	7	0	0	0	0	0	0	0	0	7
Grays Harbor	62	10	4	0	1	0	1	2	0	44
Island	10	1	0	1	1	0	0	2	0	5
Jefferson	9	1	0	0	0	0	0	0	0	8
King	411	46	10	9	9	3	1	25	27	281
Kitsap	28	1	0	2	1	0	0	3	0	21
Kittitas	16	1	0	0	0	0	0	0	0	15
Klickitat	7	0	1	0	0	0	1	0	0	5
Lewis	76	9	3	1	3	0	1	1	5	53
Lincoln	4	0	0	0	0	0	0	0	0	4
Mason	12	1	2	0	1	0	1	0	0	7
Okanogan	16	3	1	1	0	0	0	0	1	10
Pacific	17	1	2	0	0	0	0	3	2	9
Pend Oreille	10	3	0	0	0	0	0	0	0	7
Pierce	153	15	3	5	6	0	1	9	8	106
San Juan	2	0	0	0	0	0	0	0	0	2
Skagit	36	6	0	3	1	0	0	0	2	24
Skamania	8	2	0	0	0	0	0	1	1	4
Snohomish	91	10	3	2	2	0	0	6	6	62
Spokane	87	11	2	0	1	0	0	12	7	54
Stevens	14	5	0	0	0	0	0	0	1	8
Thurston	62	6	0	0	4	0	0	5	8	39
Wahkiakum	2	0	0	0	0	0	0	0	0	2
Walla Walla	26	1	1	1	0	0	0	1	3	19
Whatcom	115	6	7	0	2	0	0	3	8	89
Whitman	8	1	0	0	1	0	0	2	0	4
Yakima	90	12	3	2	3	0	0	2	5	63

Table F. Number by Major Topographical Classification and by Counties of Recipients of Blind Assistance February, 1936 to March, 1939, State of Washington

County	Topographical Classification								
	Total	Eyeball (1)	Cornea (3)	Iris & Ciliary Body (4)	Crystalline Lens (5)	Choroid & Retina (6)	Optic Nerve (7)	Vitreous Humor (8)	Ill-defined (9)
All Counties	1573	353	130	75	476	231	215	8	85
Adams	2	0	0	1	0	1	0	0	0
Asotin	2	0	0	0	1	0	1	0	0
Benton	13	5	2	0	5	0	1	0	0
Chelan	32	7	0	0	17	4	3	1	0
Clallam	32	5	3	0	11	3	5	1	4
Clark	40	8	3	2	18	4	4	0	1
Columbia	7	2	1	1	3	0	0	0	0
Cowlitz	41	11	3	4	12	3	1	0	7
Douglas	12	1	0	0	6	2	1	0	2
Ferry	2	0	0	0	0	2	0	0	0
Franklin	6	1	0	0	2	3	0	0	0
Garfield	5	1	0	1	1	2	0	0	0
Grant	7	1	1	0	3	1	0	1	0
Grays Harbor	62	19	4	1	17	11	8	0	2
Island	10	6	0	0	0	3	0	0	1
Jefferson	9	1	0	0	2	2	3	1	0
King	411	97	34	28	106	53	72	0	21
Kitsap	28	8	3	1	8	4	2	1	1
Kittitas	16	3	1	1	8	1	2	0	0
Klickitat	7	5	0	0	2	0	0	0	0
Lewis	76	15	8	3	25	9	9	1	6
Lincoln	4	0	0	0	0	4	0	0	0
Mason	12	1	1	0	5	4	1	0	0
Okanogan	16	1	3	2	4	1	4	0	1
Pacific	17	4	2	0	4	2	4	0	1
Pend Oreille	10	2	1	0	4	1	1	1	0
Pierce	153	33	14	6	44	25	23	0	3
San Juan	2	1	0	0	1	0	0	0	0
Skagit	36	10	4	0	9	6	3	0	4
Skamania	8	2	0	1	1	0	1	0	3
Snohomish	91	13	7	4	30	11	19	0	7
Spokane	87	17	5	4	29	14	17	0	1
Stevens	14	4	3	0	5	1	0	0	1
Thurston	62	17	6	2	16	14	4	0	3
Wahkiakum	2	0	0	0	1	1	0	0	0
Walla Walla	26	7	0	0	6	2	3	0	8
Whatcom	115	28	8	9	32	24	14	0	0
Whitman	8	1	1	0	1	1	1	1	2
Yakima	91	17	12	4	37	12	8	0	1

Table G. Number of Treatment and Surgical Cases, by Counties, Served Through Prevention of Blindness Program, June 1937 to March 1939, State of Washington

County (1)	Number of Individuals Served						
	Total Blind Assistance (2)	Old Age Assistance (3)	Other Relief* (4)	Non- Relief* (5)	Number of Operations (6)	Number of Treatments* (7)	(8)
All Counties:							
Number	113	30	28	25	30	152	10
Percent	100.0	26.5	24.8	22.1	26.6		
Adams	1	0	0	0	1	0	1
Chelan	7	3	0	2	2	9	0
Clallam	3	1	1	1	0	2	1
Clark	8	1	2	4	1	10	2
Grays Harbor	7	2	2	3	0	9	0
King	8	1	5	0	2	12	0
Kitsap	1	0	0	0	1	2	0
Kittitas	2	1	0	0	1	2	1
Klickitat	1	0	0	0	1	1	0
Lewis	2	0	0	2	0	3	0
Mason	6	1	1	1	3	5	3
Okanogan	1	1	0	0	0	3	0
Pend Oreille	2	1	0	0	1	5	0
Pierce	14	3	6	0	5	19	0
Skamania	1	1	0	0	0	2	0
Snohomish	13	6	3	2	2	22	1
Spokane	13	1	4	4	4	15	0
Stevens	4	0	3	1	0	4	0
Thurston	2	0	0	1	1	1	1
Wahkiakum	1	0	0	0	1	1	0
Walla Walla	2	0	0	1	1	4	0
Whatcom	7	4	1	0	2	12	0
Yakima	7	3	0	3	1	9	0

* General Assistance, 10; W. P. A. (Works Progress Administration), 12; Blind Assistance applicants, 2; Aid to Dependent Children, 1.

** Treatment for Glaucoma, 5; Ophthalmia Neonatorum, 1; Keratitis, 1; Eye Injury, 1; Trachoma, 2.

Table H. Number, by Type and by County, of Operations Given Through Prevention of Blindness Program, June, 1937, to March, 1939, State of Washington

County	T Y P E O F O P E R A T I O N									
	Total	C A T A R A C T			Enu-	Irid-	Ptery-	Need-	Tre-	Other
	Opera-	Total	Suc-	Unsuc-	clea-	ectomy	gium	ling	phi-	
	tions	Cata-	cess-	cess-	tion				nes	
		ract	ful	ful						
All Counties:										
Number	152	85	64	21	18	19	7	11	4	8
Percent	100.0	55.9	75.3	24.7	11.9	12.5	4.6	7.2	2.6	5.3
Chelan	9	7	5	2	0	0	0	0	0	2
Clallam	2	1	1	0	1	0	0	0	0	0
Clark	10	2	2	0	1	3	2	1	1	0
Grays Harbor	9	4	2	2	4	0	0	0	1	0
King	12	7	3	4	2	2	0	0	1	0
Kitsap	2	1	1	0	0	0	0	1	0	0
Kittitas	2	1	1	0	0	1	0	0	0	0
Klickitat	1	1	1	0	0	0	0	0	0	0
Lewis	3	0	0	0	0	0	3	0	0	0
Mason	5	3	3	0	0	1	0	0	0	1
Okanogan	3	1	0	1	0	0	0	2	0	0
Pend Oreille	5	3	2	1	1	1	0	0	0	0
Pierce	19	16	15	1	0	3	0	0	0	0
Skamania	2	1	1	0	0	0	0	1	0	0
Snohomish	22	9	5	4	6	2	0	4	0	1
Spokane	15	9	8	1	0	2	0	0	1	3
Stevens	4	3	2	1	1	0	0	0	0	0
Thurston	1	0	0	0	1	0	0	0	0	0
Wahkiakum	1	1	1	0	0	0	0	0	0	0
Walla Walla	4	2	2	0	0	2	0	0	0	0
Whatcom	12	8	5	3	1	1	0	1	0	1
Yakima	9	5	4	1	0	1	2	1	0	0

